Customer Service Hotline 400-619-2001

EXCELLENT & SMART

Creat a better life with smart drive

CUMARK

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CUMARK

ES355/ES355L Compact & High Performance
STO Safety Frequency Converter 0.4 to 4.0kW
Small size, great power



High reliability/ Superior Quality / Made in China

Low Voltage inverter series I High Voltage inverter series I Explosion-proof inverter I System solution provider

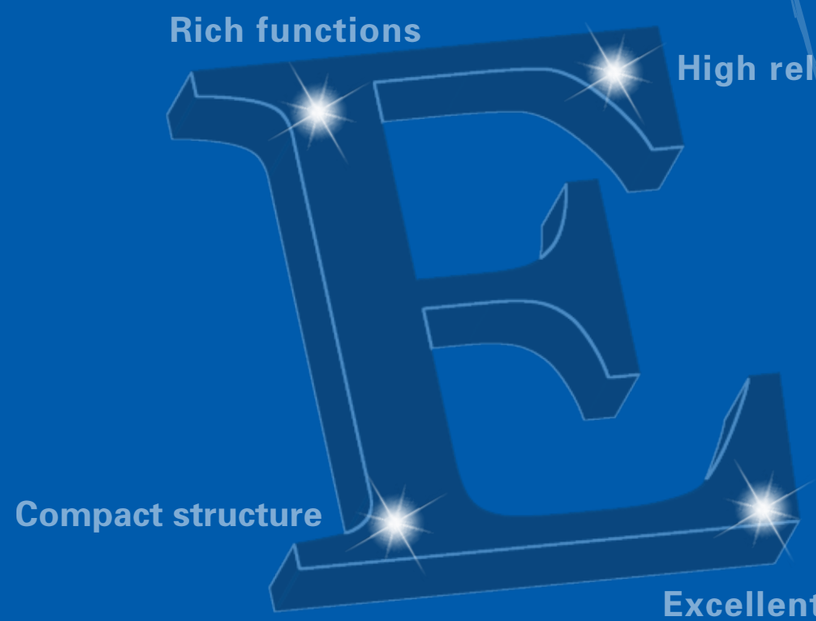
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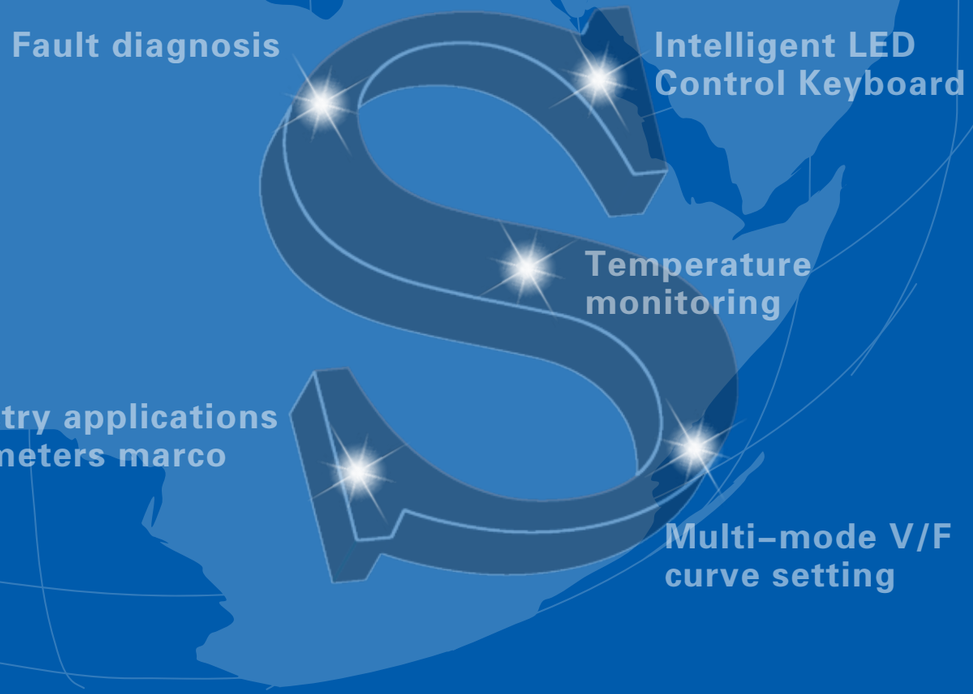
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ES series Frequency Converter

Excellent & Efficient
Intelligence Drives the Future

ES355 series frequency converter is a newly designed compact transmission product of CUMARK. It has the characteristics of small size, convenient use, reliable performance, wide range of applications, and high cost performance.





ES355 Frequency Conveters/ Company Profile



SHENZHEN CUMARK SCI.& TECH CO.,LTD. was founded on March 19, 2001. It has been focusing on R&D, production and sales of power electronic transmission and automation products . It is a national high-tech enterprise and awarded as "special frequency conversion engineering technology R&D center of Guangdong Province" . It relies on excellent technology and many years' accumulated industry application experience, and provides users with efficient and reliable intelligent drive products and complete automation solutions.

CUMARK' s high, medium and low voltage series of intelligent frequency inverters and their relatd automation integrated products have a wide range of application prospects. They can be widely used in CNC machine tools and robots, marine engineering equipment, ships, rail transit equipment, Energy-saving and new energy vehicles, agricultural machinery and equipment, logistics and warehousing, electric power, coal, petrochemical, chemical, environmental protection, pharmaceuticals, non-ferrous metals, steel and other fields can help manufacturers improve equipment automation, energy conservation and efficiency, and reduce production costs, help the equipment manufacturing industry products green and intelligent upgrades and improve market competitiveness.

In the process of internationalization, CUMARK will take "creating a better life with smart drive" as its corporate mission, with the corporate spirit of "pragmatic, efficient, pioneering and innovative" to overcome all difficulties and realize its corporate vision. We believe that CUMARK will be service-oriented, high-tech, and world well known in the future.

Service Outlets



List of ES Series Frequency Converters



Type	Performance	Target market	Series	Appearance
General purpose	1) Standard configuration STO safety torque off function 2) Support V/F and SVC vector control 3) Support permanent magnet synchronous motor/asynchronous motor control 4) Standard C3 filter 5) Large screen LCD or LED keyboard can be connected externally 6) All DI terminals both support PNP & NPN input, DI4 supports 60kHz high-speed input 7) Standard configuration of magnetic flux braking function 8) The carrier frequency can be adjusted intelligently according to the temperature	Food Machinery; Textile machinery; Small water pump; Packaging Machinery; food processing; Wood carving; Blower; Logistics machinery; Electronics manufacturing; etc.	ES355(Asynchronous) ES355L(Asynchronous & PM Synchronous) 220V 1PH 0.4~2.2kW 220V 3PH 0.4~2.2kW 380V 3PH 0.75~4.0kW	

Technical Data 1

Item		Specification and Technical Data
Main power connection	Input voltage U1	1Ph ~220V±15%/3Ph ~220V±15%/3Ph ~380V±15%
	Input frequency f1	47~63Hz
	Output voltage U2	0...U1（V）(The maximum output voltage equals the input power voltage.)
	Output frequency f2	0-599 Hz
	Carrier frequency	2-12KHz (The device can intelligently and automatically make optimal adjustment according to load characteristics and drive temperature.)
	Input voltage unbalance degree	Maximum: ±3% of rated inter-phase input voltage
	Efficiency	≈98% (when operating at ratedpower)
Basic functions	Input frequency resolution	Digital setting: 0.01Hz/RPM Analog setting: Maximum Frequency/ RPM*0.05%
	Control mode	V/F control, SVC control
	Startup torque	100% @ 0.5Hz for V/F control, 100% @ 0.25Hz for SVC control.
	Speed adjustment range	1: 100 @ V/F control; 1: 200 @ SVC Control;
	Torque boost	Manual torque boost 0~10%
	V/F Curve	Intelligent adaptive
	V/F Separation	Full separation
	Acceleration & Deceleration curves	Straight-line/ Multi-segment/ S-curve acceleration& deceleration method, Two acceleration time and its range : 0.0s-650.00s.
	Simple PLC function	Up-to-16-stages Speed (acheived by PLC or output terminals)
	Built-in PID	Conveniently achieve the process control via close-loop feedback system
	Automatic voltage regulation (AVR)	When the grid voltage changes, the device automatically maintains constant output voltage.
	Automatic acceleration & deceleration function	Automatic extend the acceleration/deceleration time to avoid frequent overvoltage/overcurrent fault.
	Protection function	Output short circuit protection, input and output phase loss protection, overcurrent protection, overvoltage protection, undervoltage protection, overheat protection, overload protection, safe torque stop and other protection functions ect.
	STO safe torque stop function	When the equipment is overhauled, ensure that the equipment stops reliably.
	Non-stop during transient interruption	Keep the frequency inverter running in a short time during the sudden power failure (In case of instantaneous power failure, the load will feed back energy to compensate for the voltage drop).
	Flux brake	Can realize fast stop without braking resistor
	Synchronous stop after power failure	When the power grid is unexpectedly cut off, it can ensure that multiple inverters are steadily and synchronously stopped.
	Fieldbus communication	Built-in standard Modbus interface, self-defining simple CAN communication is optional.

Technical Data 2

Item		Specification and Technical Data
I/O Interfaces	Command input mode	Keyboard input, Control terminals input, Field bus communication input
	Speed reference mode	Digital, Analog (AO termnials & Built-in potentiometer), Pulse , Fieldbus communication , and PID .
	Input terminal	The followings are included in standard configuration : - 4 digital input terminals(suport PNP and NPN, among DI4 support 60kHz High-speed pulse) - 1 analog input terminal(0~+10V/4~20mA), - 2 STO function terminals.
	Output terminal	The followings are included in standard configuration : - 1 digital output DO1, support 60kHz hig-speed pulse & 0~50Hz squarewave pulse. - 1 analog input terminal(0~+10V/4~20mA), - 1 relay output terminal, NO/NC selection.
Display and control	Man-machine interface	Standard fixed LED keyboard, support external detachable large-screen LCD or LED keyboard.
	Parameters duplicating	Rapidly duplicating parameters via the LCD control keyboard
Application environment	Application site	Indoor, free of direct sunshine, dusts, corrosive gases, flammable gases, oil mist, water vapor, drip or salts
	Altitude	0-1000m ; When the altitude is 1000-4000m, the capacity is reduced by 1% as the altitude rises by 100m. (consult professionals for more accurate values)
	Operation ambient Temperature	-10℃ ~ +55℃ when the ambient temperature is 40℃-55℃, the driveis automatically derated to achieve self-protection)
	Relative humidity	Less than 95%RH. No droplets condensed (condensation)
	sinusoidal vibration	(IEC 60068- 2/-6.TestFc) Max.0.1mm (5 to 13.2Hz) ; max.7m/ s^2 (13.2 to 100 Hz) Max.0.1mm (10 to 57Hz) ; max.10m/ s^2 (57 to 150Hz)
	Impact	Not allowed (during operation); maximum 100m/s^2,11ms(during storage and transportation with packing)
	Free fall (Max.)	Not allowed (during operation); with packing : 100cm @F0-2,76cm @F0-4,46cm @F5-7,15cm @F8-9
	Storage & temperature	-40℃ to+70℃
Protection grade		IP20
Cooling method		The air flows from bottom to top. Air-cooled radiator.
Application standard		IEC 61800-3 (2004), IEC61800-5-1 (2007) ; GB12668

Structural Features

1）Compact and dynamic design;

2）The smiling face design is novel and unique;

3）Independent air duct, direct heat dissipation;

4）Multiple products can be installed side by side seamlessly;

5）European-style wiring design: spring-type terminals,
push-type quick wiring;

6）helmsman turntable potentiometer operation knob;

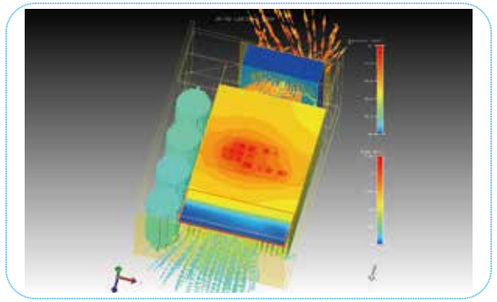
7）Low noise (even silent) design;



ES355 Series Frequency Converter/High Reliability

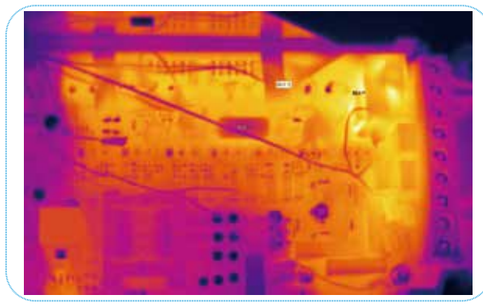
Compact Structure Design

- With the innovative thermal design philosophy and first-class efficient thermal simulation software, create the innovative and unique design which provides this product with a comprehensive and systematical heat dissipation structure and solution.
- Advanced heat testing and verification technologies with thermal imaging device guarantee thermal reliability of the product system.



Rigorous Temperature Rise Test on the Frequency converter

- Rigorous testing procedures for full load and overload verification as well as strict temperature rise acceptance standards for key components are adopted to enable the product to operate reliably under extreme overload conditions for a long time.
- 100% load ageing at 40°C
- All products shall pass the high temperature load aging test before delivery, which can effectively prevent failure components, and guarantee product quality.



Spraying Process of Conformal Coatings

- Multiple layer high-quality conformal coatings are sprayed to enhance the product's stability at harsh environment.
- The automatic spraying process of conformal coatings equipment ensures the uniform coating thickness of the circuit board and production efficiency .



Note: The automatic spraying line of three-proofing lacquer

High Protection Grade

- Especially applied in cables, machine tools, ceramics and textiles industries where the site environments are severe, humid or dusty.
- Protection grade IP20 (0.4-4kW) as standard, IP40 high protection grade available on request.



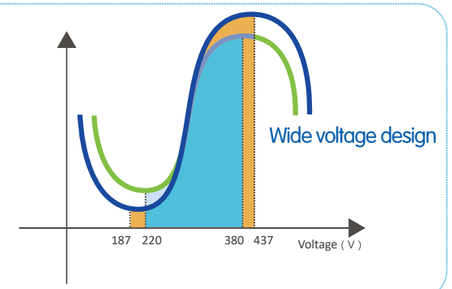
Anti–interference Capability

- In a standard configuration, the built-in input C3 filter to reduce EMC interference and guarantee the steady operation of the Frequency converter.
- EMC jumper design is convenient to switch for Grounding and EMC interference reduce.



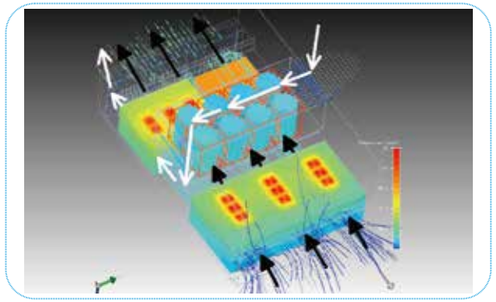
Wide Voltage Range Design

- Rated voltage: single phase220V; three-phase 220V/380V;
- Input voltage frequency:50-60Hz±5Hz
- Acceptable voltage fluctuation: -15% to +15%



Innovative Heat Sink and Air Duct Design

- The design can prevent dust and other foreign body from entering the inside of the frequency converter, thereby avoiding circuits electric short and components damage.
- Electronic components are separated from the main cooling system by the poor conductor or wind screen, to avoid component failures due to the main-power radiator high temperature.



Selection and Design of Key Components

- Strict component selection testing procedures are adopted. All power components such as the rectifier, IGBT and electrolytic capacitor are from good quality supplier.
- Large allowance and derating design ensures reliability of key components.

CE Certification Compliance

- The ES series products meet relevant requirements of European CE directives.

Comprehensive Motor Drive Technology

- Support the control of all types motor (three-phase asynchronous, permanent magnet synchronous).Frequency converter.
- Support the speed and torque control modes.



Accurate and Comprehensive auto tuning Function

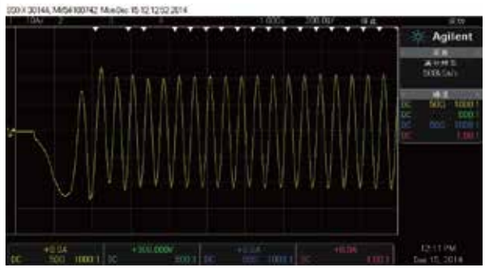
- The converter is capable of accurately learning motor parameters, providing higher control precision and response speed.
- The comprehensive and rich auto tuning functions cover various motor tuning and mechanical tuning functions.

Motor Auto-tuning

Rotary self-learning	Mostly suitable in applications of high starting torque, high speed and high control precision.
Standstill self-learning	Mostly suitable in applications of commissioning when the motor and handling machines are connected.

Large StartupTorque

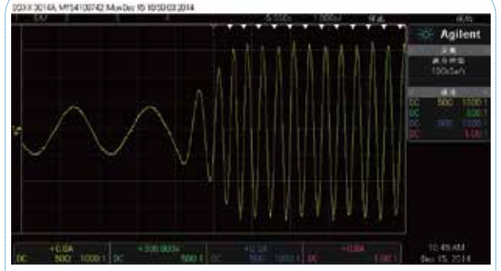
- 100% @0.5Hz(V/F control)
- 100% @0.25Hz(SVC vector control)



FAST STARTUP CURRENT WAVEFORMS OF 4 kW ASYNCHRONOUS MOTOR AT 200%LOAD

Fast Torque Response, Low Torque Pulse

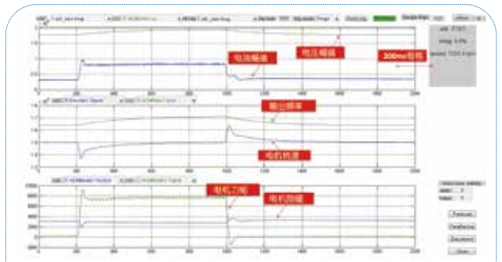
- Torque response SVC vector : <20ms



Current waveforms of 4kW asynchronous motor with 0.5HZ at 200% load suddenly

Wide Speed Range, High Steady–speed Precision

- Speed range :
  V/F control : 1:100
  SVC vector : 1:200
- Steady-speed precision:
  SVC vector:10% rated slip



Waveforms of different key signals when the 4kW asynchronous motor is suddenly loaded or unloaded with 150% load at 1500 rpm in the open-loop state (data is collected from the frequency converter and the background tool of the computer only receivesdata and generates waveforms)

High Overload Capacity

- Run for 60s at 150% rated load
- Run for 2s at 200% rated load

ES355 Frequency converter / Rich Function & Easy Operation

Friendly human–machine interface

- Fixed LED keyboard as standard, can support external detachable large LED or LCD keyboard





Rich Application Micros

- Various built-in typical mechanical applications micros such as fans,water pumps, compressor and conveyor unit.
- When the mechanical micro is selected. frequency converters automatically set parameters to optimum values, thereby eliminating tedious parameter setting and shortening trial run time.



ES355 Inverter Frequency Converter/intelligent drive

Unique Smart Drive

- Intelligent LCD control keyboard: User-friendly HMI with copy function.
- Fault diagnosis: It records extreme operation conditions of the frequency converter, including the maximum current, voltage and maximum temperature, which are easy for fault detection. It also records load conditions, which are convenient for users to optimize electric drive schemes.
- Manual V/F curve Setting: Users can adjust the V/F curve according their actual need.
- Intelligent V/F curve setting: It automatically optimizes the parameters based on motor parameters, no need manual setting.
- Intelligent parameter setting for industry applications: Users only need to select an industry application, and the device automatically matches optimum parameters, eliminating tedious parameter setting.
- Intelligent temperature monitoring: It detects the temperature at key components and controls the temperature of the frequency converter by algorithms.

Naming Rules

ES XXX - XX - XXXG - 3 - XXXXXY

- ES: Drive product series
- XXX: Product series
  - 355 Asynchronous motor control
  - 355L Permanent magnet synchronous/asynchronous motor control
- XX: BO: Frame Mode
- XXXG: Rated power in heavy load applications

0K4	···	4K0
0.4kW	···	4.0kW

- 3: Voltage class
  - 1 : single phase 220 V
  - 2 : three phase 220V
  - 3 : three phase 380V
- XXXXXY: Non-standard customized model

Selection of ES355 Products

Rated voltage 1ph 220V (adapted to working voltage range 220±15 %)

Model Code	Rated Value (A)	Rated Power (kW)	Power loss (W)	Noise Level (dB)	Air Volume (m3/h)	Dimension
ES355-B0-0K4G-1	2.5	0.4	40	*	*	B0
ES355-B0-0K7G-1	4.5	0.75	65	36	30.6	
ES355-B0-1K5G-1	7	1.5	80	36	30.6	
ES355-B0-2K2G-1	9	2.2	92	36	30.6	

Note: (1) * indicates no fan product, relying on natural air cooling, close to silent;
(2) Power rating is measured at rated voltage 220V.

Rated voltage 3ph 220V (adapted to working voltage range 220±15 %)

Model Code	Rated Value (A)	Rated Power (kW)	Power loss (W)	Noise Level (dB)	Air Volume (m3/h)	Dimension
ES355-B0-0K4G-2	2.5	0.4	40	*	*	B0
ES355-B0-0K7G-2	4	0.75	76	36	30.6	
ES355-B0-1K5G-2	5	1.5	97	36	30.6	
ES355-B0-2K2G-2	8	2.2	125	36	30.6	

Note: (1) * indicates no fan product, relying on natural air cooling, close to silent;
(2) Power rating is measured at rated voltage 220V.

Rated voltage 3ph 380V (adapted to working voltage range 380±15 %)

Model Code	Rated Value (A)	Rated Power (kW)	Power loss (W)	Noise Level (dB)	Air Volume (m3/h)	Dimension
ES355-B0-0K7G-3	2.5	0.75	40	*	*	B0
ES355-B0-1K5G-3	4	1.5	76	36	30.6	
ES355-B0-2K2G-3	5	2.2	97	36	30.6	
ES355-B0-4K0G-3	8	4.0	125	36	30.6	

Note: (1) * indicates no fan product, relying on natural air cooling, close to silent;
(2) Power rating is measured at rated voltage 380V.

Selection of ES355L Products

Rated voltage 1ph 220V (adapted to working voltage range 220±15 %)

Model Code	Rated Value (A)	Rated Power (kW)	Power loss (W)	Noise Level (dB)	Air Volume (m3/h)	Dimension
ES355L-B0-0K4G-1	2.5	0.4	40	*	*	B0
ES355L-B0-0K7G-1	4.5	0.75	65	36	30.6	
ES355L-B0-1K5G-1	7	1.5	80	36	30.6	
ES355L-B0-2K2G-1	9	2.2	92	36	30.6	

Note: (1) * indicates no fan product, relying on natural air cooling, close to silent;
(2) Power rating is measured at rated voltage 220V.

Rated voltage 3ph 220V (adapted to working voltage range 220±15 %)

Model Code	Rated Value (A)	Rated Power (kW)	Power loss (W)	Noise Level (dB)	Air Volume (m3/h)	Dimension
ES355L-B0-0K4G-2	2.5	0.4	40	*	*	B0
ES355L-B0-0K7G-2	4	0.75	76	36	30.6	
ES355L-B0-1K5G-2	5	1.5	97	36	30.6	
ES355L-B0-2K2G-2	8	2.2	125	36	30.6	

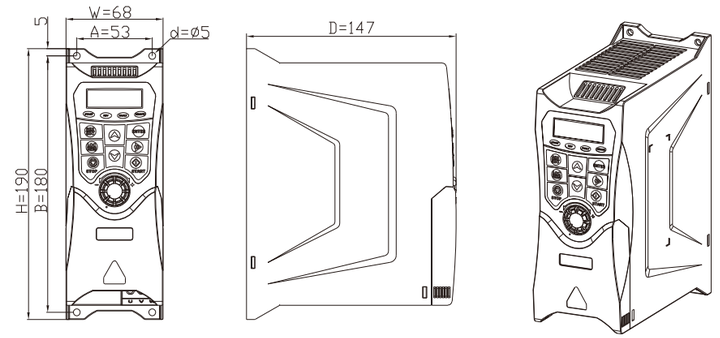
Note: (1) * indicates no fan product, relying on natural air cooling, close to silent;
(2) Power rating is measured at rated voltage 220V.

Rated voltage 3ph 380V (adapted to working voltage range 380±15 %)

Model Code	Rated Value (A)	Rated Power (kW)	Power loss (W)	Noise Level (dB)	Air Volume (m3/h)	Dimension
ES355L-B0-0K7G-3	2.5	0.75	40	*	*	B0
ES355L-B0-1K5G-3	4	1.5	76	36	30.6	
ES355L-B0-2K2G-3	5	2.2	97	36	30.6	
ES355L-B0-4K0G-3	8	4.0	125	36	30.6	

Note: (1) * indicates no fan product, relying on natural air cooling, close to silent;
(2) Power rating is measured at rated voltage 380V.

Dimensions

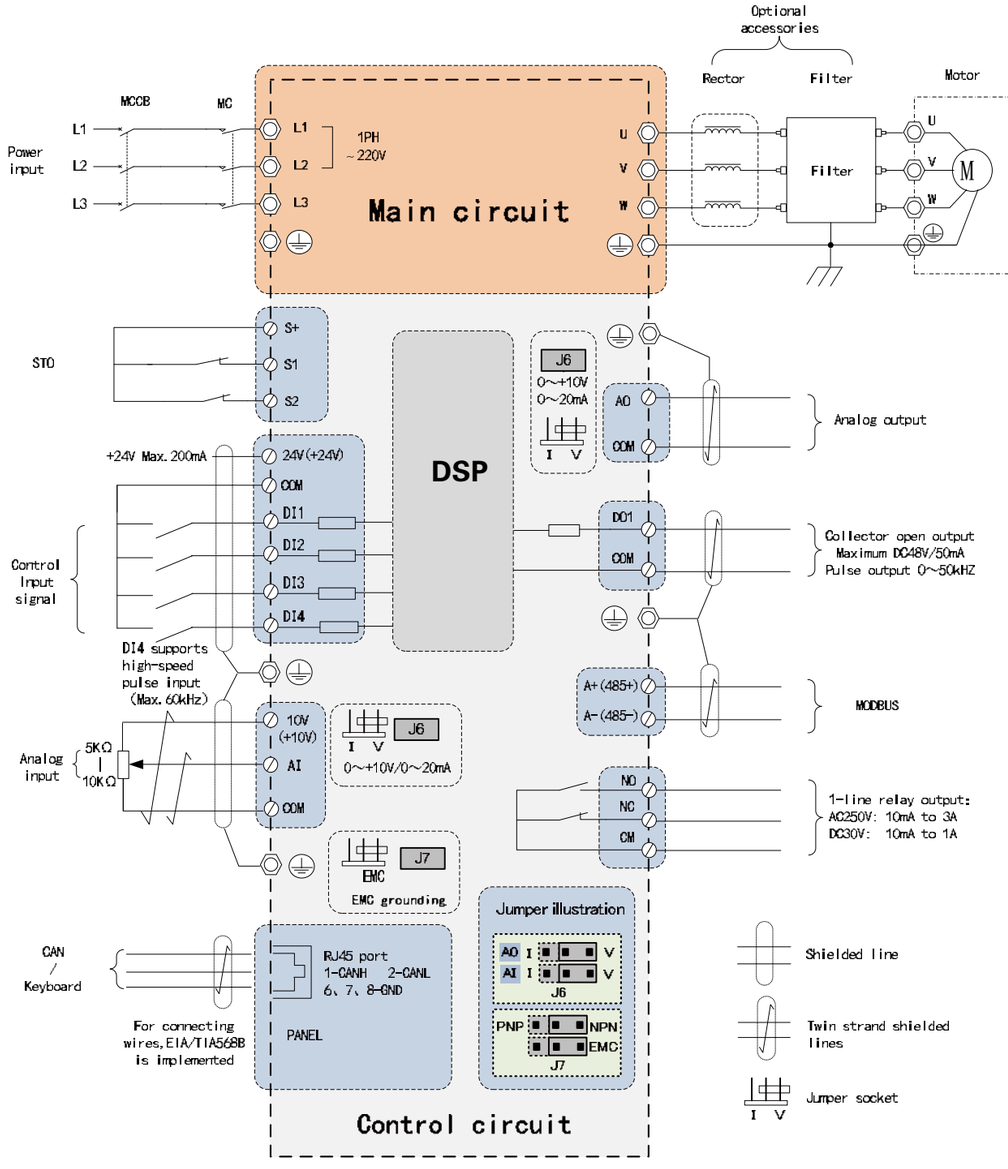


Dimension	Installation Hole Width Spacing A (mm)	Installation Hole Height Spacing B (mm)	Installation Hole Sized (mm)	Appearance Width W (mm)	Appearance HeightH (mm)	Appearance Thickness D (mm)	Weight (Kg)
B0	53	180	5.0	68	190	147	1.5

Optional Accessories

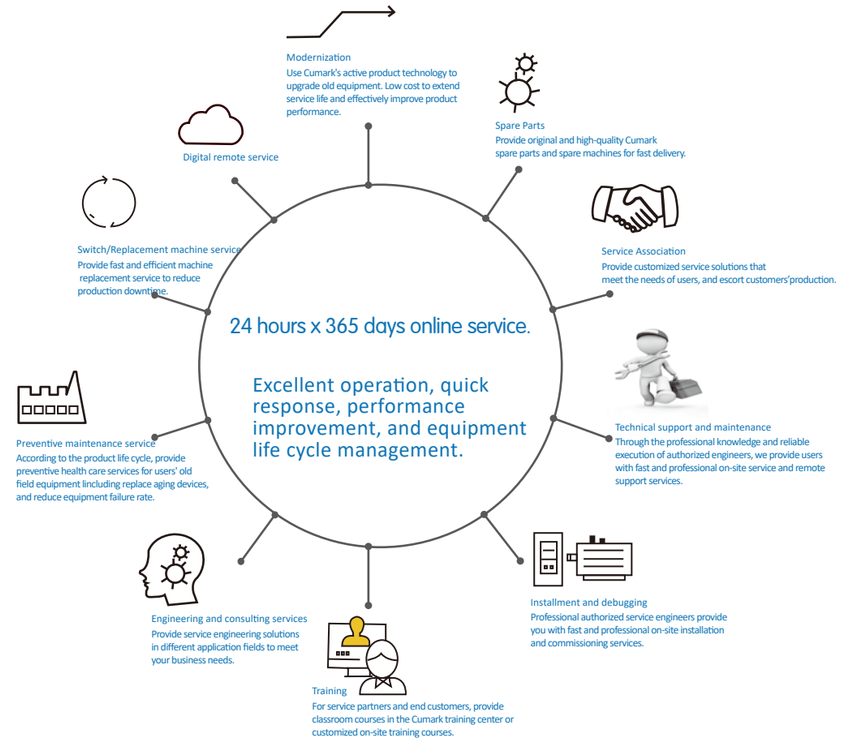
Legend	Model	Accessory and Main Function
	ES-CP-MU	LCD control keyboard, optional part
	ES-CP-MUE	LED control keypad, optional part
	ES-CP-SU	Extention bracket of the control keyboard, which is applicable to installation of the LCD keyboard on cabinet
	Debug Window software	Visualized parameter debugging, fault display, waveform monitoring through PC

Standard Wiring Diagram

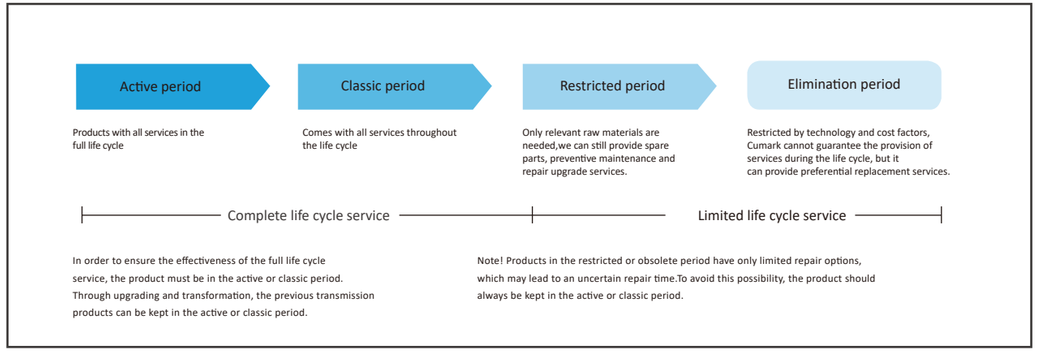


Service product summary

The Cumark technical service teams across China, together with Cumak authorized service partners, provide you with a full range of pre-sales and after-sales technical services. Your success is our goal. Cumark will tailor a full lifecycle management solution for you to escort your business growth.



Cumark product life cycle management mode



Note

Note